

METHOD AND APPARATUS FOR INSTALLING WINDSHIELDS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit under 35 U.S.C. 119(e) of US Provisional application No. 60/528,149, filed December 9, 2003.

BACKGROUND OF THE INVENTION

[0002] The present invention relates generally to a method and apparatus for supporting a windshield during installation of the windshield. In one aspect, the present invention relates to windshield support assemblies for supporting a windshield during installation, and to a method for using such windshield support assemblies when installing a windshield.

DESCRIPTION OF PRIOR DEVELOPMENTS

[0003] Vehicle windshields often become cracked or damaged and when such occurs it is necessary to replace the windshield. The windshield is typically bonded to a window frame of a vehicle with a urethane bonding agent. Because the urethane bonding agent often requires several hours to set up and cure, various types of supports have heretofore been proposed for assisting in the setting of windshields, such as the windshield spacer disclosed in U.S. Patent No. 6,170,208 B1.

[0004] In addition, problems have been encountered in positioning the windshield in the window frame of a vehicle due to the weight and bulkiness of the windshield. Thus, the windshield is subject to being broken during handling and installation.

[0005] Accordingly, a need exists for an improved method and apparatus for installing windshields which substantially eliminates breakage of the windshield during installation and which properly positions the windshield relative to the window frame of the vehicle. It is to such a method and apparatus that the present invention is directed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Fig. 1 is a fragmental, pictorial representation of a vehicle having a windshield thereof removed and showing two windshield support assemblies of the present invention connected to a portion of a frame of the vehicle.

[0007] Fig. 2 is a fragmental, pictorial representation of a portion of a vehicle illustrating a person installing a windshield wherein the windshield is supported on two of the windshield support assemblies of the present invention.

[0008] Fig. 3 is a perspective view of one of the windshield support assemblies constructed in accordance with the present invention.

[0009] Fig. 4 is a side elevational view, partially in cross section, of the windshield support assembly of Fig. 3.

DETAILED DESCRIPTION OF THE DRAWINGS

[0010] Referring now to Figs. 1 and 2, shown therein is a window frame 10 of a vehicle 12 having two windshield support assemblies 14 and 16 connected to the vehicle 12. The windshield support assemblies 14 and 16 are provided with support members 18 and 20, respectively, which are connected to a portion of a frame 22 located in the pinch weld of the vehicle 10 prior to removal of the damaged windshield so that the support

members 18 and 22 of the windshield support assemblies 14 and 18 are properly positioned relative to the window frame 10 for supporting a windshield 24 during installation of the windshield 24.

[0011] The windshield support assemblies 14 and 16 are connected to the portion of the frame 22 such that upper surfaces 26 and 28 of the support members 18 and 20, respectively, are disposed substantially adjacent a lower edge (not shown) of a damaged windshield. By positioning the windshield support assemblies 14 and 16 such that their respective support members 18 and 20 are disposed substantially adjacent a lower edge of the damaged windshield, the support members 18 and 20 are in a proper position for supporting the replacement windshield 24, both horizontally and vertically, during placement of the replacement windshield 24 in the window frame 10 of the vehicle 12. By positioning the windshield support assemblies 14 and 16 substantially adjacent a portion of the window frame 10, the support members 18 and 20 of the windshield support assemblies 14 and 16 prevent the replacement windshield 24 from sliding or moving in a downward direction as the replacement windshield 24 is bonded to the window frame 10 of the vehicle 12, while at the same time preventing the weight of the replacement windshield 24 from extruding urethane or other sealants or bonding agents from between the replacement windshield 24 and the window frame 10. Thus, the windshield support assemblies 14 and 16 not only assist one in positioning the replacement windshield 24 in a proper position within the window frame 10, but also stabilizes the replacement windshield 24 in a desired position during curing of the urethane or sealant or bonding agent so that a substantially water-tight seal is formed between the replacement windshield 24 and the window frame 10 of the vehicle 12.

[0012] The windshield support assemblies 14 and 16 are substantially identical in construction and function. Thus, only the windshield support assembly 14 will be described in detail herein after with reference to Figs. 3 and 4.

[0013] The windshield support assembly 14 includes the support member 18 and a self-tapping or sheet metal screw 30. The self-tapping screw 30 is driven into a portion of the frame 22 of the vehicle 12 located in the pinch weld of the vehicle 12 (Figs. 1 and 2) such that the support member 18 of the windshield support assembly 14 is disposed adjacent and below the old windshield (not shown). Thus, the windshield support assembly 14 is positioned relative to the window frame 10 so as to support the replacement windshield 24 during installation of the replacement windshield 24.

[0014] The support member 18 of the windshield support assembly 14 is provided with a first or upper end 32, a second or lower end 34 and a passageway 36 extending there between. The support member 18 of the windshield support assembly 14 is fabricated of a substantially non-resilient material so as to provide stability to the replacement windshield 24 when the replacement windshield 24 is positioned thereon and disposed within the window frame 10 of the vehicle 12.

[0015] Any suitable material can be employed to fabricate the support member 18 of the windshield support assembly 14 provided that the material from which such support member 18 is fabricated of any material which is substantially non-resilient. Examples of materials from which the support member 18 can be fabricated includes "nylon 6/6", "Teflon" or polyolefins such as high density polypropylene and high density polyethylene, wood, metal and the like.

[0016] The cross sectional configuration of the support member 18 can be cylindrical, square shaped, rectangular, hexagonal shape or any other shape as long as the support member 18 is capable of supporting the replacement windshield 24 thereon during positioning of the replacement windshield 24 in the window frame 10 of the vehicle 12, and supporting the replacement windshield during curing of the urethane or other bonding material employed to secure the replacement windshield 24 within the window frame 10. However, desirable results have been obtained wherein the support member 18 is a cylindrical-shaped member having a circular cross-section.

[0017] The overall dimensions of the support member 18 can vary widely as long as the support member 18 is capable of supporting the replacement windshield 24 thereon. When the support member 18 is a cylindrical shaped member, desirable results have been obtained wherein the support member 18 is provided with a circular cross section having a diameter of about 3/8 inch, a length of about 3/4 inch and wherein the passageway 36 extending between the first end 32 and the second end 34 thereof is provided with a diameter of about 1/8 inch.

[0018] The self-tapping screw 30 employed to secure the support member 18 to the frame 22 of the vehicle 12 will vary in length and size depending upon the length of the support member 18, as well as the diameter of the passageway 36 extending between the first end 32 and the second end 34 of the support member 18. Desirably the self-tapping screw 30 is capable of cutting it's own hole in the frame 22, have a cylindrical shaft 40 which can be threadably disposed through the passageway 36 extending between the first and second ends 32, 34 of the support member 18, and has a length such that a distal end

42 of the self-tapping screw 30 is spaced a distance 44 from the second end 34 of the support member 18. Preferably, the self-tapping screw 30 is provided with a head portion 46 which has a diameter 48 greater than a diameter 50 of the support member 18 so that a support ledge 52 is formed between the head portion 46 of the self-tapping screw 30 and the first end 32 of the support member 18 when the self-tapping screw 30 is threadably disposed through the passageway 36 of the support member 18. For example, when the support member 18 is a cylindrical shaped member having a length of about 3/4 inch, a diameter of about 3/8 inch and the passageway extending therethrough is substantially centrally disposed and has a diameter of about 1/8 inch, the self-tapping screw 38 employed to connect the support member 18 to the frame 22 of the vehicle 12 desirably has a length of about 1/4 inch, and the head portion 46 of the self-tapping screw 30 has a diameter of about 7/16 inch.

[0019] While the self-tapping screw 30 has been shown and described as the connector for connecting the support member 18 of the windshield support assembly 14 to the frame 22 of the vehicle 12, it should be understood that any type of connector capable of connecting the support member 18 to the vehicle can be employed as long as the connector permits the support member 18 to be mechanically connected to the frame 22 of the vehicle 12 and subsequently removed therefrom after installation of the replacement windshield 24 has been completed and the urethane or bonding agent has set and cured to provide a fluid-tight seal around the replacement windshield 24.

[0020] Referring again to Figs. 1 and 2, the method of installing the replacement windshield 24 in the window frame 10 of the vehicle 12 will now be described. Initially,

wiper blades (not shown) of the vehicle 12 are removed and thereafter cowlings (also not shown) which are disposed substantially adjacent a lower edge of a damaged windshield is removed. The windshield support assemblies 14 and 16 are then secured in position below the damaged windshield by screwing the self-tapping screws, such as a self-tapping screw 38, into the frame 22 of the vehicle 12 such that the windshield support assemblies 14 and 16 are disposed in the pinch weld of the frame 22 and the support member 18 and 20 of the windshield support assemblies 14 and 16 are positionable adjacent a lower edge (not shown) of the damaged windshield. Thereafter, the damaged windshield is removed and the window frame 10 is cleaned of any remaining debris from the previous sealant used to secure the damaged windshield in the window frame 10 of the vehicle 12. Once the residual sealant has been cleaned from the window frame 10 of the vehicle, an effective amount of sealant, such as a bead of urethane, is applied to one of a perimeter portion of a lower side 54 of the replacement windshield 24 or the window frame 10. Alternately, the sealant can be applied to both the perimeter of the lower side 54 of the windshield 24 and the window frame 10 of the vehicle 12.

[0021] Once the effective amount of urethane has been applied, the replacement windshield 24 is then positioned on at least one support assembly, and preferably both of the windshield support assemblies 14 and 16. Thereafter, the replacement windshield 24 is moved into engagement with the window frame 10 while the replacement windshield 24 remains supported on the support assemblies 14 and 16. The replacement windshield 24 is maintained in a supported position on the support members 18 and 20 of the windshield support assemblies 14 and 16 for a period of time effective to permit the urethane to cure and thereby provide a fluid-tight seal between the replacement windshield 24 and the

window frame 10.

[0022] After the windshield 24 has been properly set within the window frame 10, and the urethane has cured, the windshield support assemblies 14 and 16 are removed from the portion of the frame 22 of the vehicle 12 located in the pinch weld of the vehicle 12 by backing off the self-tapping screws, such as a self-tapping screw 38. Once the windshield support assemblies 14 and 16 have been removed, the cowl is replaced, and thereafter the wiper blades are installed.

[0023] While it has been shown as utilizing the windshield support assemblies 14 and 16 for installing the replacement windshield 24, it should be understood that one could employ only one of the windshield support assemblies, such as the windshield support assembly 14, if desired, without departing from the concept of the present invention. Further, when employing both of the windshield support assemblies 14 and 16 for installing the replacement windshield 24, it is desirable that the windshield support assemblies 14 and 16 be spatially disposed so as to enhance stabilization of the replacement windshield 24 thereon.

[0024] It should be noted that the windshield support assemblies 14 and 16 of the present invention permit an individual to properly position the replacement windshield 24 within the window frame 10 of the vehicle 12 while substantially reducing the likelihood of breaking the replacement windshield 24. In addition, the ledge 52 formed between the head portion of the self-tapping screws, such as the head portion 46 of the self-tapping screw 30, and the first ends of the support members, such as the first end 32 of the support member 18, cooperate to prevent the replacement windshield 24 from

inadvertently slipping off of the support members 18 and 20 of the windshield support assemblies 14 and 16 when the windshield support assemblies 14 and 16 are properly attached to the frame 22 of the vehicle 12 and the replacement windshield 24 is positioned thereon.

[0025] While the head portions of the self-tapping screws, such as the head portion 46 of the self-tapping screw 30, have been shown as having a diameter greater than the diameter of the support members 18 and 20 of the windshield support assemblies 14 and 16, it should be understood that the diameter of the head portions of the self-tapping screws of the windshield support assemblies 14 and 16 can be less than the diameter of the support members 18 and 20 of the windshield support assemblies 14 and 16.

[0026] It should be understood that while the present invention has been described in connection with a preferred embodiment, those skilled in the art would appreciate that other modifications can be made without departing from the spirit of the invention after studying the specification and the drawings.